Patent claims

1. Method for determining the spatial coordinates of an object, in which the object is illuminated with light patterns with a projection device from at least two directions, and the projected light patterns are recorded point by point on the object with a two-dimensional-resolution first recording device, wherein, for the respective recorded points of the surface of the object, phase values are determined and these are used to calculate geometrical parameters and spatial coordinates of the points, characterised in that the light patterns or portions thereof projected onto the object from the at least two directions are additionally recorded point by point by at least one second recording device, wherein the at least one second recording arrangement remains stationary in relation to the object to be measured, and in that from the points of the projected light patterns recorded with the second recording device are determined at least four phase measurement values from which the geometrical parameters of the projection device for the at least two directions of projection are calculated.

2. Method according to claim 1, characterised in that, after determination of the geometrical parameters of the projection device, the geometrical parameters of the first recording device are calculated using the geometrical parameters of the projection device with the respective projection direction and at least two phase measurement values which are determined from the light patterns recorded with the first recording device and projected from the respective direction.

3. Method according to claim 1 or 2, characterised in that, using the predetermined geometrical parameters of the projection device and of the first recording device and at least one phase measurement value which is determined from the light patterns recorded with the first recording device and projected from the respective direction, the three-dimensional coordinates of the respective points of the object are calculated.

4. Method according to any of claims 1 to 3, characterised in that, after projection of the light patterns from a first direction and recording of the view of the object from a first direction, the projection device and the first recording device are changed from a first position to a second position for projection from a second direction and recording of another view of the object from a second direction.

5. Method according to any of claims 1 to 4, characterised in that, for measurement of different views of the object, the projection device and the first recording device are changed together to different positions.

6. Method according to any of claims 1 to 5, characterised in that the geometrical parameters of the projection device and of the first recording device are orientation parameters.

7. Method according to claim 3, characterised in that two phase measurement values are used and each spatial coordinate is calculated twice and averaging is carried out.

8. Method according to any of claims 1 to 7, characterised in that the object is illuminated from each direction of projection in a first step with a line grid and/or Gray code sequences and in a second step with the line grid rotated through 90° relative to the direction of projection and/or the Gray code sequences rotated through 90°.

9. Device for carrying out the method according to any of claims 1 to 8, with at least one sensor arrangement comprising a projection device which projects light patterns and a first, two-dimensional-resolution recording device for recording an object illuminated with the light patterns, with at least one second recording device for recording the object illuminated with the light patterns, with a measuring table which holds the object to be measured, and with an evaluating device for determining parameters of the measuring system and/or spatial coordinates of the object, wherein the at least one second recording device is stationary in relation to the object held on the measuring table, and the sensor arrangement and the object are movable relative to each other.

10. Device according to claim 9, characterised in that the projection device and the first recording device of the sensor arrangement are rigidly connected to each other.

11. Device according to claim 9, characterised in that the projection device and the first recording device of the sensor arrangement are movable and/or changeable independently of each other.

12. Device according to any of claims 9 to 11, characterised in that the sensor arrangement is arranged on a rotating unit at the centre of which is located the measuring table, and the sensor arrangement performs a rotational movement in relation to the object.

13. Device according to any of claims 9 to 11, characterised in that the measuring table is rotatable and the at least one second recording device is rigidly connected to the rotatable measuring table, while the sensor arrangement is arranged stationarily.

14. Device according to any of claims 9 to 11, characterised in that the sensor arrangement is attached so as to be freely positionable to a guide track rotatable about the measuring table preferably through 360°.

15. Device according to any of claims 9 to 14, characterised in that a plurality of second recording devices are provided stationarily relative to the measuring table.

16. Device according to any of claims 9 to 15, characterised in that the second recording device comprises at least three photodetectors.